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GPS Reflections for Land Geodesy and Imaging

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Recently, several groups have been working to exploit the abundant GPS signals that are continually reflected from the earth's surface as a means of remotely acquiring geodetic measurements of land and sea. Adding to an initial development by J. Labreque, S. Lowe and others, we have built and tested an airborne bistatic GPS receiver system capable of recording several hours of continuous GPS measurements from an antenna pointing upward toward the GPS satellites, and another pointed downward toward the Earth. Essentially a bistatic spread spectrum radar with a direct signal link for phase and positioning reference, this system is potentially capable of continuous geodetic measurements of the dynamic earth in the specular reflected direction, bistatic radar imaging of surfaces at multiple polarizations, and with some augmentation interferometric geodesy and imaging for refined estimation. This paper will give an overview of the system capabilities, and present preliminary

results from recent land-based and airborne acquisitions.

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